

Assessing the Nontarget Effect of Transgenic (European Corn Borer- Resistant) Corn Hybrids on Anthracnose Stalk Rot Development

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Abstract

A research project was conducted to determine whether anthracnose stalk rot (ASR) reduction (and the associated protection of grain yield) is a nontarget benefit that can be expected of transgenic (insect resistant) corn hybrids deployed for management of European corn borer (ECB). Grain yield, insect and disease development, and standability were monitored in field plots of transgenic and near-isogenic (nontransformed) corn hybrids infested at mid-whorl stages with ECB, the anthracnose fungus, or both. Previous results indicated that Bt hybrids were promising for management of this pest complex, but damaging levels of first brood ECB were not encountered in experiments that relied on natural, local insect populations. Artificial infestation was utilized in this experiment. Unfortunately, because of unusually harsh environmental conditions at the experimental site, only a low percentage of first brood ECB larvae survived long enough to invade corn stalks. This resulted in a low incidence of insect injury during corn vegetative stages. Although anthracnose stalk rot incidence was low overall at the brown silk stage, ASR was significantly lower in the transformed (Bt) version of each hybrid pair. It has been shown previously that ASR at this early growth stage can result in large losses of grain yield. These results provide further evidence that yield protection can be expected from Bt corn hybrids in the presence of *C. graminicola* and low to moderate populations of first brood ECB typically encountered in New York. It is still unclear whether such protection against early ASR will occur in the presence of high populations of ECB encountered occasionally in New York, but frequently in the US Corn Belt. We cannot effectively deploy Bt corn hybrids on New York farms to reduce losses to ECB and ASR until we have available better means for predicting an ECB infestation in a particular location prior to corn planting.

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